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THE HORN SPEAKER

The History of Broadcasting in the United States

By H. P. DAVIS, Vice-President

Westinghouse Electric & Manufacturing Co.

An address delivered before the Graduate School of Business Administration, Harvard University, April 21, 1928.

The advances made by civilization have been very largely in proportion to the development of communication. Starting with mouth to mouth and eye to eye contact, progressively through the ages there has been a gradual evolution of mass communication, until, in our present day, it is exemplified and developed in many ways.

Mass Communication

It is hard even for one who has seen in his lifetime the awakening of this mighty colossus—asleep since the beginning of time—to realize the amazing achievements and developments of the twentieth century in mass communication. To you, of the present generation, the perspective is less clear, therefore not so intimate, and is looked upon more in a matter of fact way. Yet no longer than 61 years ago a prominent Boston newspaper published the following article:

"A man about 46 years of age, giving the name of Joshua Coppersmith, has been arrested in New York for attempting to extort funds from ignorant and superstitious people by exhibiting a device which he says will convey the human voice any distance over metallic wires so that it will be heard by the listener at the other end. He calls the instrument a 'telephone' which is obviously intended to imitate the word 'telegraph' and win the confidence of those who know of the success of the latter instrument without understanding the principles on which it is based.

"Well-informed people know that it is impossible to transmit the human voice over wires as may be done with dots and dashes and signals of the Morse Code, and that, were it possible to do so, the thing would be of no practical value. The authorities who apprehended this criminal are to be congratulated and it is hoped that his punishment will be prompt and fitting, that it may serve as an example to other conscienceless schemers who enrich themselves at the expense of their fellow creatures."

The youngest but the most promising addition to these facilities for mass communication is radio broadcasting.

Experiments Prior to World War

Attempts had been made, and some successful results had been accomplished, prior to the World War, in adapting telephonic principles to radio communications. Reginald Fessenden, probably the first to attempt this, transmitted a program Christmas Eve 1906. Later, Mr. Lee DeForrest did the same in the development of his apparatus. No real service, however, was attempted or introduced of a character similar to that now known as radio broadcasting. The war bringing an end to independent development work, attention was concentrated on such applications of radio as would be helpful in military operations, and the various Governments engaged in the conflict enlisted the aid of all the large electrical companies that had facilities available.

The Westinghouse Electric & Manufacturing Company, having extensive research, engineering and manufacturing facilities of a nature suitable for this branch of electric science, was requested by the British Government, shortly after the outbreak of the war, to undertake certain special work in radio. Considerable study on the part of Westinghouse engineers was devoted to this, but no special progress was made of a permanent character, as our own Government began an attempt to develop such facilities, foreseeing the possibility of needing them later.

This activity took form in several fields. One, however, was the development of radio transmitting and receiving apparatus, both telegraphic and telephonic. In order to carry out this work it was necessary to have transmitting and receiving stations, and by special license from our Government, the Westinghouse Electric & Manufacturing Company was permitted to build and operate such facilities for experimental purposes.

Two stations were designed, equipped and operated during the war. One was located near its plant at East Pittsburgh, Pennsylvania, and the other at the home of Dr. Frank Conrad in the Pittsburgh residential district, a distance of four or five miles separating the two stations. The calls of these stations were—2WM and 2WE.

Your speaker was in charge of the Westinghouse Company's war activities. Dr. Conrad was then serving as one of his assistants and among other things was especially assigned to radio work. Dr. Conrad's work was very closely coordinated with that of the United States Signal Corps.

Dr. Conrad became very much engrossed in this work, and in characteristic manner began to do research, developing new ideas and making important advances in the art. As a result, a considerable amount of money was invested in this equipment and a large staff of experts organized.

With the end of the war, the Company found itself with this investment and organization on its hands, and the re-establishment of patent restrictions, most of which were adversely held, placed the Company in a position of considerable difficulty in con-

tinuing this work. The progress that had been made during the war period, however, encouraged it to continue. Seeking a way to establish itself in the industry, negotiations were undertaken, and finally successfully concluded, whereby a controlling interest was purchased in the International Radio Telegraph Company which owned many important fundamental radio patents.

The International Radio Telegraph Company owned and operated several ship-to-shore radio stations, and was a pioneer in this field. The operation and development of this service immediately became a part of Westinghouse activities.

Seek to Develop Radio Service

A large sum of money having been expended for the control of the International Radio Telegraph Company emphasized in our minds the necessity for developing our new acquisition into a service which would broaden, popularize and commercialize radio to a greater extent than existed at that time, in order to earn some return on this investment as well as to keep the radio organization together.

In seeking a revenue-returning service, the thought occurred to broadcast a news service regularly from our ship-to-shore stations to the ships. This thought was followed up but nothing was accomplished because of the negative reaction obtained from those organizations whom we desired to furnish this news material service. However, the thought of accomplishing something which would realize the service referred to, still persisted in our minds.

During this period Dr. Conrad had continued his experiments with the station at his home and had greatly improved his radio telephone transmitter. Following the date on which Government restrictions were removed from radio stations, Dr. Conrad quite regularly had operated this radio telephone transmitter to send out interesting programs of one kind or another, and to such an extent that people with receiving sets became sufficiently interested to listen to his station.

The program material available to him was largely phonograph records, although there were some talks, baseball and football scores. The station, whose call letters had been changed, was then designated as 8XX and was known as one of the best amateur stations in the country.

Effect of Newspaper Ad

We were watching this activity very closely. In the early part of the following year the thought came which led to the initiation of a regular broadcast service. An advertisement of a local department store in a Pittsburgh newspaper, calling attention to a stock of radio receivers which could be used to receive the programs sent out by Dr. Conrad, caused the thought to come to me that the efforts that were then being made to develop radio telephony as a confidential means of communication were wrong, and that instead its field was really one of wide publicity; in fact the only means of instantaneous collective communication ever devised. Right in our grasp, therefore, we had that service which we had been thinking about and endeavoring to formulate.

Here was an idea of limitless opportunity if it could be "put across". A little study of this thought developed great possibilities. It was felt that here was something that would make a new public service of a kind certain to create epochal changes in the then accepted everyday affairs, quite as vital as had the introduction of the telephone and telegraph, or the application of electricity to lighting and to power.

We became convinced that we had in our hands, in this idea, the instrument that would prove to be the greatest and most direct mass communicational and mass educational means that had ever appeared. The natural fascination of its mystery, coupled with its ability to annihilate distance, would attract, interest and open many avenues to bring ease and happiness into human lives. It was obviously a form of service of universal application, that could be rendered without favor and without price.

Decided to Start Station

Resulting from this idea was the decision to install a broadcasting station at East Pittsburgh and to initiate this service. This decision was made early in 1920, although it was not until fall that the equipment was ready for operation. In the interim, we held many interesting and now really historical conferences to plan our undertaking.

Dr. Frank Conrad, Assistant Chief Engineer; Mr. J. C. McQuiston, General Advertising Manager; Mr. S. M. Kintner, Manager of Research Department; Mr. O. S. Schairer, Manager Patent Department; Mr. L. W. Chubb, Manager Radio Engineering Department, and Mr. M. C. Rypinski, Sales Department—all of the Westinghouse Electric & Manufacturing Company—participated in these conferences, and it was their experience, advice, constant faith and loyal efforts in the undertaking and the development that followed that carried the project to success.

Cooperation of Press

One of the earliest decisions was the necessity of building up and obtaining necessary public interest in our efforts through the cooperation of the daily press. It happened that we were most fortunately situated to accomplish this. Mr. A. E. Braun, the directing head of the Pittsburgh Post, a morning paper, and the Pittsburgh Sun, an evening paper, was an officer in the International Radio Telegraph Company, and the cooperation of these papers and his hearty support were immediately forthcoming. This, with Mr. McQuiston's acquaintanceship and contacts with other press channels, and his work with Mr. Braun, added much to building up the public interest which led to the final great success of the venture.

Main Objectives

The main objectives which we laid down as basic have guided our radio broadcasting ever since, and were—

1. To work, hand in hand, with the press, recognizing that only by published programs could the public fully appreciate a broadcasting service.

2. To provide a type of program that would be of interest and benefit to the greatest number, touching the lives of young and old, men and women, in various stages and conditions of life.

3. To avoid monotony by introducing variety in music, speeches, etc.

4. To have distinctive features so timed as to assure their coming on at regular periods every evening; in other words, as a railroad does by its time-table.

5. To be continuous. That is, operate every day of the year. KDKA has operated without a break in schedule since the opening of the station.

In our discussion the subject of the first program was a matter of very careful deliberation. We wanted to do something unusual —we wanted to make it spectacular; we wanted it to attract attention.

First Program Spectacular

It happened that 1920 was the presidential election year, and the happy thought occurred to us to open our station on the night of the election returns and to broadcast this news. Through the cooperation of Mr. Braun our plans matured with the decision to open on November 2, 1920—which we did—and the result was the historical broadcast by KDKA of the Harding election. The election returns were gathered in the office of the Pittsburgh Post, in

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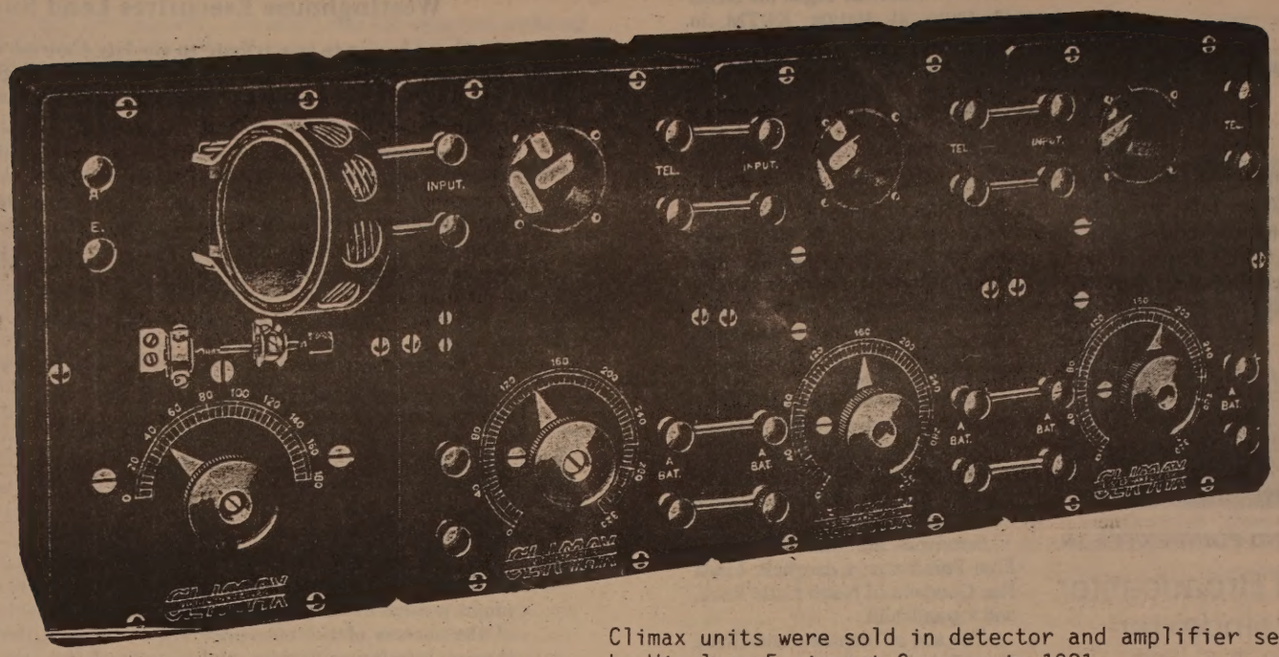


Climax units were sold in detector and amplifier sections by Wireless Equipment Company in 1921.

Pittsburgh, and from there telephoned to East Pittsburgh where they were relayed by another operator and broadcast by this new service.

A broadcasting station is a rather useless enterprise unless there is someone to listen to it. Here was an innovation, and even though advertised, few then, other than possibly some of the amateurs who had receiving sets, could listen to us. To meet this situation we had a number of simple receiving outfits manufactured. These we distributed among friends and to several of the officers of the Company. Thus was the first broadcast audience drafted.

Broadcasting Begins

As a matter of historical record and sequence in the origin and progress of radio broadcasting as a public service, the following chronicle of events is important:

After a period of testing and experimental operation, the Westinghouse Electric & Manufacturing Company on November 2, 1920, at East Pittsburgh, Pa., put into operation the first broadcasting station in the world, now known as KDKA, and transmitted as its first program the returns of the Harding presidential election. Following this, a daily program from 8:30 to 9:30 P. M. was immediately instituted. The daily schedule of the station has been continued without interruption up to the present time.

After nine months of continuous operation of Station KDKA, the Westinghouse Company opened WBZ at Springfield, Mass., in September, 1921; followed on October 12, 1921 by WJZ at Newark, N. J., and on November 11, 1921, by KYW at Chicago, Illinois.

It was not until the summer of the next year that any other stations of prominence were placed into operation, and very few then, as it was a considerable time later that the great rush for wavelengths took place and the confusion introduced that now exists in the broadcasting wavebands.

Our first broadcasting was from a rough box affair upon the roof of one of the taller buildings at the plant, which still stands there although no longer in use, and the development of the broadcasting studio is an interesting story.

Broadcast Westinghouse Band

In the first few months of operation of KDKA, program material was drawn largely from phonograph records. It was recognized almost immediately by us, however, that no great interest or progress in broadcasting service would be possible if material differing from this type of entertainment were not available. The Westinghouse employes have always had a number of musical organizations, among them a very good band. We decided to broadcast this. Later, we organized the KDKA Little Symphony Orchestra.

Our phonograph was operated in the room in which the transmitter was located, and the announcer and others who had taken part in the program up to this time also had been using this room. With larger aggregations of talent, however, it was necessary to seek bigger quarters, so one of the auditoriums at East Pittsburgh was put into use. We immediately had difficulty in obtaining fidelity in the broadcast, due, apparently, to room resonance. To correct this, we thought of placing the band in the open air and to transmit from out-of-doors. When this was done the result was a marked improvement. As a result of this, we saw at once that if we wished to accomplish good sound reproduction, specially designed rooms would be required to broadcast from—but how, was not clearly apparent and in addition the expense incident to it was a serious problem.

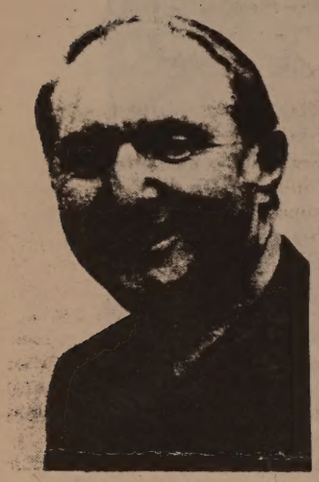
As the warmer weather was approaching, we decided to broadcast our artists from this open air studio which, as before stated, was on the roof of one of the taller buildings at the plant. For protection we erected a tent. This proved good, and everything went along satisfactorily during the summer and early fall, until one night a high wind blew the tent away—and so our first studio passed out and into history.

Move Studio Indoors

Necessity has always been the mother of invention, and having managed to keep our service going for nearly a year we could not think of discontinuing it because we had no studio—but we saw that we would have to go indoors. We, therefore, decided to try the tent inside. Part of the top floor of this high building was cleared and the tent "pitched" on this floor. We were pleased to find that it worked as effectively as it had out-of-doors. Thus was the first indoor broadcasting studio developed.

The subject of a specially constructed studio, however, was again revived and designs prepared for it. Taking the lesson of the tent to heart, we draped the whole interior of the new studio with the cheapest material we had available—burlap. We had now all the elements of the present studio.

The principles that were originated by our experience have governed the design of the present-day studios, but the lowly



RAYMOND POINDEXTER JR.

Noted Broadcaster Ray Poindexter Dies at Age 65

Raymond Poindexter Jr., 65, of 204 W. I St., a veteran Arkansas radio broadcaster, author and a former English and speech teacher at Ole Main High School, died March 11.

Mr. Poindexter, a native of Walnut Ridge, earned a bachelor's degree from Southwest Missouri State University and a master's degree from the University of Central Arkansas.

Mr. Poindexter began his career in radio at station KBTM in Jonesboro. From there he moved to positions at KELD at El Dorado, KDRS in Paragould. KNBY in Newport and KVLC in Little Rock.

Mr. Poindexter moved to North Little Rock in 1953. In 1957, he established the Arkansas School of Broadcasting, which he later sold.

In the 1960s, Mr. Poindexter combined radio and education when he began teaching at Ole Main High School. He served as dean of boys for one year at Ole Main. He also taught broadcasting at the University of Arkansas at Little Rock.

Mr. Poindexter wrote two books, Arkansas Airways and Golden Throats and Silver Tongues.

During World War II, Mr. Poindexter served as a Naval officer in the South Pacific Theater.

Survivors are his wife, Hazel Flint Poindexter; a daughter, Linda Rae Goodwin of North Little Rock, and a grandchild.

The son of Raymond and Grace Hurst Poindexter, he was a Methodist, a member of the Arkansas Broadcasters Association and a life-time member of the Retired Officers Association.

The funeral was held March 14 at Griffin-Leggett/Rest Hills Chapel by the Rev. Sam Teague. Burial was at Rest Hills Cemetery.

Memorials may be made to the American Heart Association and the American Diabetes Association.

burlap has changed its name to the more dignified name of monk's cloth. Other materials, however, have been developed in this intervening period, and the walls, ceilings and floors of studios are now built of materials which are non-resonant in character so that the use of monk's cloth is required less than formerly.

One cannot but be impressed with what radio has accomplished in a few short years when one compares this first tent studio with the wonderful studios and equipment of the National Broadcasting Company.

The Amateurs Rebel

KDKA had in the beginning a power of only 100 watts, but this was, of course, more powerful than the transmitting sets used by amateurs in those days. The amateurs, until our advent, had the field to themselves and had enjoyed the entire freedom of the air.

Our broadcasting transmitter coming into the picture was obviously not received with open arms by them as the continuous operation of the transmitter interfered to a large extent with their work. At that time most amateurs were using spark sets, and our broadcasting in turn was seriously marred by interference from that source. It came to a point of more or less open warfare, with the amateur operators, if anything, having the best of it.

It must be said, however, to the credit of the amateurs, that later when it was evident to them that the public was seriously interested in our efforts, their organization formulated rules of ethics, which, when observed, quite materially corrected this condition.

You can appreciate from this that the first year of our operations was beset with many difficulties and discouragements, and many discussions were had as to whether the game was worth the candle. But we persisted.

Westinghouse Executives Lend Support

I am happy to pay tribute to the late General Guy E. Tripp, Chairman of the Board of Directors of the Westinghouse Electric & Manufacturing Company, and to Mr. E. M. Herr, President, for their broad-minded support and patience. They had confidence in us and backed the undertaking in a personal way, as well as with contributions from the Company's funds to develop this new service. Finally, these efforts were rewarded by an aroused interest on the part of the public—an interest that grew almost to fever pitch in a stampede late in the year 1921, overwhelming an industry wholly unprepared for it.

Public Interest Awakened

Radio broadcasting became a conversational topic as universal as the weather, and the spell of it became world wide. It is probably a fact that when the response came, no facility or service ever received such a reaction from the public or grew so fast in popularity, when the public was awakened to what it really was. When this happened, almost over night a scientific novelty and a hazardous experiment was transformed into a wide-spread and popular public service.

Thus was radio telephone broadcasting born - a new public service; a service for the benefit or entertainment of any one who might possess even the simplest receiving equipment. The secret of the success of the enterprise lay in the fact that there were then no interfering stations, and because of this only very simple receiving sets were required to "listen in". This was fortunate, as there was nothing else and the available sets were cheap. Being telephonic, the communications could be understood by every one. They required no translation and were substantially unlimited as to the character of the subject matter that might be transmitted and received. In addition, there was the marvel and fascination of listening to messages received out of space with very simple and inexpensive apparatus.

Newspapers Assisted Growth

We attribute much of this public response to the press work we had been doing. From the start we had sent our announcements and copies of programs to a list of representative newspapers. At first these schedules were typewritten and went to a limited list, but later they were printed, a larger list used, and an organized program of information was carried out in a magazine, which we started, called "Radio Broadcasting News" and sent to about 2000 newspapers. It was not long before KDKA's programs were printed in newspapers all over the United States and in every province of Canada.

In addition to this, a factor which probably contributed much to the success of broadcasting at this time was that broadcasting was done regularly, at well advertised times of the day or night, and the programs consisted of matter that was of general interest—worth listening to.

Briefly, we endeavored to render a real public service, with regularity, presenting well planned, high grade, interesting and timely advertised programs. It was our conception that it could be made a valuable service different from anything then in existence and adapted to accomplish something entirely new, which was the distinguishing characteristic of our undertaking. This, and our sense of duty to the listening public, assisted in firmly establishing this effort as a definite and all-embracing service.

Church Service Begins

The first real pick-up service ever attempted was that of the services of the Calvary Episcopal Church of Pittsburgh. Here, again, is an interesting story.

We had been sending out originally, as previously indicated, music and entertainment from phonograph records, and as we had determined to broadcast every day we naturally included Sunday. Our week-day form of program material did not seem quite suitable for Sunday evening purposes. Accordingly, we had a discussion about the matter and the happy suggestion was made—"Why not try to broadcast a church service". But how?

After consideration of the difficulties involved, especially in picking it up, a plan was worked out which we felt would make

the technical part possible. As music was the principal make-up of our program, our thought naturally gravitated to the Episcopal service. It so happened that one of our engineers was a member of the choir of the Calvary Episcopal Church in the East Liberty section of Pittsburgh. He was called in, the matter explained to him, and he promised to see what could be done.

We were to learn later that fortune was with us in this thought to the extent that the Rector of that Church—Dr. E. J. van Etten, who is a broad-minded, far-sighted and progressive individual—immediately was interested in our proposal and a connection was formed then that has continued to the present day.

On January 2, 1921, the daring experiment was made of broadcasting the services of Calvary Episcopal Church. This was successful, and was so well received that it became a regular feature.

Dr. van Etten, First Radio Minister

Dr. van Etten was the first minister whose church services were broadcast. His was the first voice to be heard in a broadcasting of divine services, and he has undoubtedly, through his enthusiasm in this work, done more to bring happiness and religious comfort to the masses of people than any other living man.

The broadcasting of church service alone, which was initiated by KDKA, was in itself sufficient to make radio broadcasting permanent and invaluable. The innovation was at once unique and compelling in its appeal to people of all ages, classes and denominations, and it has proved to be one of the greatest, most popular and beneficent features ever presented. Even today it is doing more to enlarge the church's sphere of influence than any medium heretofore employed.

It is my belief that the happy thought that led to the inclusion of a church in our broadcasting, and our success in selecting the church that we did, the idea of cooperating with the press and the public interest that we gained through it, coupled with our feeling of responsibility and with our unbounded confidence in the future of the service which we had initiated and were developing, and the soundness of the principles we had laid down for our guidance, formed the solid foundation upon which this whole broadcasting industry has been built.

Recognizing the need of expert advice in the development of programs, we sought the cooperation of Mr. Harvey Gaul, the musical director of Calvary Episcopal Church, to assist us in determining the best selection of artists and music. Mr. Gaul was thus the first radio impresario and during the period he was with us he made some valuable contributions to radio musical lore and broadcasting technique.

Early Forecasting

There is a common saying that "hind sight is better than foresight", and in the light of today's accomplishments it is easy to ascribe many virtues to ourselves and to our undertaking.

But what do the records show? In an article which I wrote in February, 1921, only three months after regular broadcasting had been established, the following truly prophetic statements were made:

"The adaptability of the radiophone to broadcasting reports, news, entertainments, concerts, lectures, etc., creates a field particularly its own.

"It is quite possible that especially constructed transmitting rooms will be provided for such purposes, so that voices and music will be broadcast through unbounded areas and listened to by invisible and widely distributed audiences of vast numbers. The same opportunities would thus exist for the country dweller as for the city resident, and inmates of hospitals and sanitariums, and sick people and invalids in the home, would have opportunities for pleasures and diversions now denied them.

"The importance of reaching such tremendous numbers of people, with practically no effort, offers great possibilities for advertising and the distribution of news and important facts, and in reality introduces a 'universal speaking service'. It is not unreasonable to predict that the time will come when almost every home will include in its furnishings some sort of loudspeaking radio receiving instrument, which can be put into operation at will, permitting the householder to be in more or less constant touch with the outside world through these broadcasting agencies.

"The field of radio application is practically unlimited in the important affairs of the world, and this development will mark one of the great steps in the progress and evolution of mankind."

Again, in another article which I prepared in January, 1922, the following appears:

"And where will it end? What are the limitations? Who dares to predict? Relays will permit one station to pass its message on to another, and we may easily expect to hear in an outlying farm in Maine some great artist singing into a microphone many thousand miles away. A receiving set in every home; in every hotel room; in every school room; in every hospital room. Why not? It is not so much a question of possibility - it is rather a question of 'how soon'."

A dream then has become a reality now.

Pioneer Records

As part of the pioneer records of KDKA we have the honor to record that Honorable Herbert Hoover's first radio broadcast address was transmitted by KDKA. The address was presented during a dinner held at the Duquesne Club, Pittsburgh, Pa., January 15, 1921, to raise funds for European relief work. Mr. Hoover's pioneer address was followed by addresses of others of prominence. Our records reveal that on February 18, 1921, KDKA transmitted the address of Miss Alice M. Robertson, then Congresswoman-elect from Oklahoma, the first woman elected to Congress, and Colonel Theodore Roosevelt, Jr. Their addresses were delivered before the Pittsburgh Press Club.

One month later, on March 19, 1921, three members of the President's Cabinet addressed the audience of KDKA. These were Honorable Andrew W. Mellon, Secretary of the Treasury; Honorable James J. Davis, Secretary of Labor, and Honorable John W. Weeks, Secretary of War. At another time Honorable William Jennings Bryan made his first radio address over KDKA.

In the history of KDKA's broadcasting there have been a host of world-famous people who have addressed the station's radio audience. The pioneer speakers were of such high calibre that they surely set up a precedent for those who followed.

Famous Radio Events

Then, in the following months, KDKA rapidly developed and presented a series of "firsts" in broadcasting history. Among these "firsts" were the re-transmission of Arlington Time Signals at 10:00 o'clock nightly. The time signal service introduced a few days after the start of KDKA became at once, and has so remained, one of the most popular and appreciated of radio features.

After the time signals, KDKA introduced the first sports events by broadcast, the occasion being a boxing contest between Johnny Ray and Johnny Dundee, held in Motor Square Garden, Pittsburgh, April 11, 1921. Both boxers, I might add, have long since retired.

Next, on May 9, 1921, KDKA broadcast from the stage of the Davis Theatre in Pittsburgh, the first theatrical program in history. On August 4, 5, 6, 1921, KDKA first broadcast tennis matches, the occasion being the Davis Cup matches held at the Allegheny Country Club, Sewickley, Pa., about 25 miles distant from the transmitting station. On August 5, 1921, KDKA transmitted the first play-by-play account of a baseball game held in the National League Park at Pittsburgh.

These pioneer athletic events were the forerunners of the tremendously interesting sports broadcasts with which the American public has been so well entertained in later years.

One of the first broadcasts made from WJZ was the World Series baseball games, with one of the New York teams as a contender.

KYW's first program was an auspicious one, it being the transmission of Grand Opera direct from the stage by artists of the Chicago Civic Opera Company. This program was the pioneer of the many delightful operatic programs which we have enjoyed in the past and which, I am happy to say, are still a tremendously interesting feature of chain hook-ups.

Story of Farm Service

In the efforts to develop a diversified program, the agricultural population, of vast importance to any agency attempting to interest all of the people of the United States, was not overlooked. To the contrary, it is another striking instance of KDKA's pioneering that the station was the first to conduct a regular farm service, which included not only livestock, hay and grain reports, but also weather forecasts. On May 19, 1921, KDKA was authorized to broadcast government market reports and immediately began this service. Since that beginning, market reports which, from time to time, have been expanded in scope, have been a nightly feature of Westinghouse broadcasting stations.

Station KFKX, now located in Chicago, is one of the very few stations whose programs are almost exclusively devoted to farm subjects.

Entire City Available for Programs

To reach the wide field of program material, an extensive system of pick-ups was worked out in Pittsburgh covering some thirty points of contact with events of public interest. Included in this arrangement are schools, churches, theatres, hotels, athletic fields, and halls, with special studios at one University and two hotels.

KYW, Chicago, and WBZ, Springfield, have similar but less extensive systems of pick-up. In the case of WBZ there is the striking feature of a line connection with Boston, 100 miles long, giving an additional pick-up system in that city and including also several studios.

This was all pioneering, and in the development of programs for our service was the endeavor constantly made to develop new and unusual features, as it is these that attract special attention, maintain public interest and win the greatest applause. It can be stated as a fact that there is hardly an element in program service today that was not covered in these early undertakings. In other words, the Westinghouse Electric & Manufacturing Company not only created broadcasting but has been one of the most active forces in developing it.

Announcers' School

We soon found that training announcers in diction and pronunciation was necessary, since for every mispronounced word we were certain to receive many letters of criticism. This condition prompted us to start an announcers' school, under the capable direction of Mr. T. H. Bailey Whipple, our Literary Critic, who held daily rehearsals of the various announcements to be made.

Most opportunely for us, we were able to secure the services of Miss Marjorie Stewart who, although blind, wrote daily constructive criticisms of all programs, pointing out where improvements might be effected. She thus became the first radio critic and due to her exceptionally keen perception, false notes in our broadcasting, exceedingly difficult for the program manager to detect before delivery of the actual program, were eradicated.

(To be continued)

A FEW WORDS FORM THE HORN SPEAKER

We got over the "big move" with not too many problems. There are some things that we can't locate. Hope they show up later. The office here in this rural area is bigger with more room to lose something.

What we consider to be an important loss is a letter or a telephone message from a reader. If you don't have the correspondent's name and address, it becomes almost impossible to recover. One letter that needs to be found is one that offered to send a series of articles on how to repair old radios. A clue to be used is that the writer wanted to send the entire series all at once, which is no problem. If you are the reader, or if you want to send in a manuscript, please do so.

Another matter is that we owe two back issues to a Bob Johnson. We need his zip code or least what state that he lives in.

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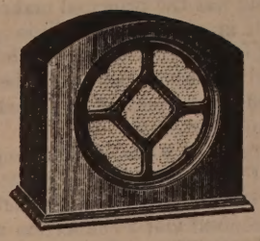

UTAH
Magnetic Cone Type

APEX
Magnetic Cone Type

26-23. Repairing the Cones of Magnetic Speakers.—Very often, the paper cone is damaged sufficiently to cause distortion or paper rattle, but not enough to make its replacement necessary. Small holes or tears in the paper may be repaired by cementing a small piece of paper over them, using Du Pont Household Cement, rubber cement, etc. Opened seams may be repaired by coating both surfaces with cement and holding them tightly together until the cement sets.

If a cone has lost its "body" or stiffness at the apex, Dupont Household Cement, or a collodion solution (which may be purchased at any drug store) should be soaked into it and allowed to harden. This will stiffen the paper and make it as good as new.

26-24. Replacing and Seating Cones.—An improperly seated cone will cause a strain to be put on the driving rod, resulting in poor reproduction. This is very likely to occur when replacing a cone. If a cone is to be replaced, extreme care should be exercised in its removal and in the installation of the new one. The screw or nut in the apex of the cone should be removed carefully, after first removing any sealing wax which may have been used to prevent it from loosening. The screws fastening the edge of the cone should be removed next.

If the speaker has a nut on the side of the cone near the thrust lever, it should be loosened (the nut screwed back) and the new cone seated. The nut or screw and washer on the outside of the driving rod should then be attached loosely. The holes at the edge of the cone should now be lined up with those of the metal frame, the outside ring put in place with the screws, and tightened one at a time (and a little at a time) to be sure that the entire periphery of the cone has the same tension. The back nut on the driving rod (if there is one) should then be screwed up until it just meets the apex of the cone. The front nut or screw is then tightened and a bit of sealing wax is placed over it to prevent the vibration from loosening it, for, if it loosens, considerable buzzing and rattling will result.

26-25. Tightening the Thrust Lever and Driving Rod.—Rattling and noisy reception are often caused by a loose thrust lever, see Fig. 26-12. The remedy for this is simply to tighten the screw that holds it to the motor assembly. Any loose screw or nut will cause an audible rattle when the speaker operates. Be certain that all parts are thoroughly secure, that all screws and nuts are tight, and that the cone is properly seated. A cone that is not properly seated may cause the drive pin to bend and displace the armature. It is best, therefore, to inspect the entire assembly before actually beginning to center the armature, if it appears to be displaced from its center position.

The drive pin is soldered to the iron armature with (hard) silver solder (see Fig. 26-12). Do not use the ordinary tin-lead alloy (soft) solder when this connection must be resoldered, as it is too weak mechanically. Silver solder may be procured in any jewelry store, and must be applied with a flame of high temperature. A special small blow torch is usually used for this work.

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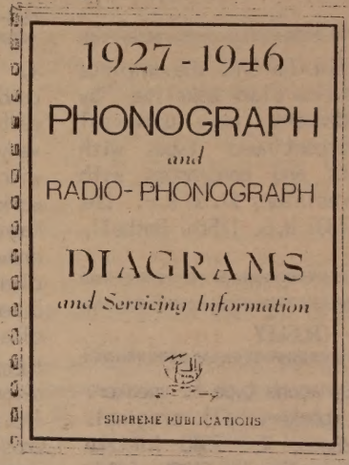

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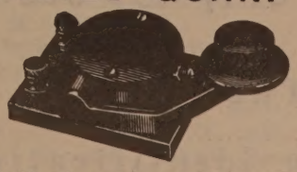

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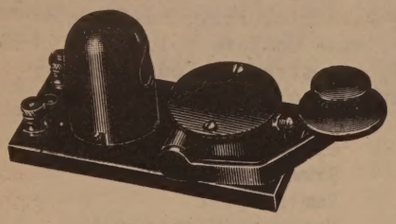

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J-7A $29
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WANTED: ZENITH 11 OR 12 BAND "TRANS-OCEANIC" TRANSISTOR, TOSHIBA "GLOBE-TROTTER," SONY "ORBITER" RECEIVERS OR PARTS, ALSO KLH-21 FM ONLY RADIO. BILL WADE, 657 14TH AVENUE, PROSPECT PARK, PA 19076.

WANTED: ENTIRE WORKS for Capehart 500K, also Edison C-1, C-2, Balmoral and Alva, Victor 10-51A, Tom Grattelo, 2818 Central, Alameda, CA 94501.

PEERLESS MODEL 19AR-60 9" DYNAMIC speaker with cabinet in good working condition. H-P model 410C VTVM working. RCA Victor R-35 radio in excellent working condition. Simpson model 1699 milliohmmeter in working condition. Radiola 20 chassis with good audios. Audio transformer for RCA Victor R15 or RCA Radiola 48. Radio Broadcast magazines for 1922 and 1928. Early Canadian Radio magazines such as October 1919. October 1921, January 1922, August and September 1924. Top prices for good condition magazines. R. A. McNeill, P. O. Box 472, Yorkton, Sask., Canada S3N 2W4 (306) 783-6121.

WANTED: DECANTER BOTTLES, ice bucket, shot and drinking glasses for model 9008-B Porto-Baradio made by Stewart Warner. Clarence MCGinnis, 1507 N. Glenn Street, Morristown, TN 37814.

WANTED: OWNERS OF EARLY ELECTRICAL magazines, MODERN ELECTRICS, ELECTRICIAN & MECHANIC, etc. I will pay for good photocopies of articles on spark gaps, high frequency Tesla & Oudin coil projects, etc. Need information for forthcoming bibliography. Write first to TCBA, RD3 Box 181, Glens Falls, NY 12801.

WANTED: WWII MILITARY Iconoscope TV camera or tube alone. OK if converted to amateur use. Canadian Marconiphone III regen., IV neutragenaflex, VI, VIIA, VIII, IX, XI. Canadian Westinghouse model W55, W55A, W60A, W57. Hammarlund Trans-Oceanic "Two", De Luxe, Hawk. Kresge Z4 Commander, Karas Short Wave Receiver. D'Arcy Brownrigg, P.O. Box 292, Chelsea, Quebec, JOX 1NO, Canada.

WANTED: A. K. MODEL 55, need everything to mate with gear on tuning condenser. Could also use but not so critical speaker or cone for above. Floor cabinet model, need ivory knob, prefer function for FADA mdl. 790. Will buy junk A.K. if it has at least the tuning parts. C. England, 98 Montague, So. Zanesville, OH 43701.

WANTED: COVER FOR A.K. 55 tin box. Also, 4 tube covers for Advance Neutrowound. Will buy junk set. Jerome Schliepp, 831 Old Berlin Road, Rippon, WI 54971.

C-4 TUBE. for Columbia radio model C-80A. SPRING AND PLATE for A.K. speaker model M. Russ Schoen, E 7340 Nietkze Road, Clintonville, WI 54929. (715) 823-6744.

I BUY BATTERY RADIOS and horns from the 20's, if you have one to sell, send me a card with name, model and price. Rick Parrish, 1260 marilyn Drive, Cape Gir., MO 63701.

WANTED: ZENITH OCEANIC 7000, TOSHIBA- GLOBAL, GRUNDIG SATELLITE OR SONY "ORBITER" BATTERY MULTIBAND SET, WADE, 657 14TH AVENUE, PROSPECT PARK, PA 19076.

WANTED: ONE VERY NICE RADIOLA 100 A LOUD SPEAKER, PLEASE WRITE: PAUL O'PATIK, 316 RUTHERFORD AVENUE, FRANKLIN, NJ 07416.

DO YOU HAVE THAT CLASSICAL 78 ALBUM that has a damaged or missing record? I have an "album singles for sale" listing that I will send to anyone for a 25 cent long self-addressed stamped envelope. Anton Johannes, R.D. #3 Box 253, Pine Bush, NY 12566.

WANTED. I BUY RADIO TV collections. Please send description and price desired. John Kendall, P. O. Box 436, Fallston, MD 21047.

WANTED— SCHEMATIC, ETC. ON BLUE RIBBON AND REMINGTON 5 TUBE RADIOS, OR OTHER RADIOS LIKE THE ABOVE. WANT TO GET THEM WORKING WITH ORIGINAL PARTS. W. G. WEAMER, 390 E. FOSTER ROAD, SANTA MARIA, CA 93455.

WANTED "TENSOR ANALYSIS OF NETWORKS" by Kron; Briggs and Stratton crystal set; accessories for "smokerette" radio. Forrest Baker, 1558 W. Garfield, Davenport, IA 52804.

WANTED —— LITERATURE

EVERY DAY MECHANICS, VOL. I, NO. 4, MAY 1916 OR A COPY OF "HOW TO BUILD A TRANS- ATLANTIC WIRELESS RECEIVING SET. K. A. LADD, 5240 44TH AVE. S., MPLS., MN 55417. (612) 722-6786.

LAFAYETTE RADIO CATALOGS - 1960 THRU 1968, PLEASE STATE CONDITION AND PRICE. MR. MICHAEL S. SABODISH, SR., 11 - A MATAWAN AVENUE, CLIFFWOOD, NEW JERSEY 07721.

WANTED: OPERATING MANUAL and tube data sheets for Jackson Dynamic tube tester model 636. Zerox copy O.K. Frank Hoffert, 19605 Chardon Road, Cleveland, OH 44117.

WANTED - INFORMATION AND SCHEMATIC for Blaupunkt Sultan 3D radio. Model number unknown, 5 tube AM/FM/SW. Write Ray Carifio, N4LTS, 6014 SW 33rd Street, Miami, FL 33155

WANTED: LIBRARY BOUND volumes of QST, CQ, 73 PRE 1960. ALSO GLOBE SCOUT (WRL), MIKE GRIMES, K5MLG, 3805 APPOMATTOX CIRCLE, PLANO, TX 75023.

WANTED: SCHEMATIC FOR SILVERTONE MODEL 7166. TOM JOHNSON, 215 E. 7TH STREET, AMES, IA 50010.

WANTED: SCHEMATIC AND INFO on Eico ST 70 amplifier. Gordon Wilson, 11108 - 50 Avenue, Edmonton, Alberta, Canada T6H 0H9.

WANTED: INSTRUCTIONS FOR PACO MODEL 25 IN-CIRCUIT CAPACITOR TESTER RCA WR-50A SIGNAL GENERATOR CRYSTALINER (CRYSTAL MODULES) GENERATOR, GLENN HARTMAN, 5545 DEEP HOLLOW, FAYETTEVILLE, NC 28311.

WANTED — PARTS, TUBES, ETC.

EARLY OR UNUSUAL TUBES, tube cans, cartons also early light bulbs pre 1900. Please describe with prices wanted to: Bruce Harbeck, 13408 Westwood Lane, Omaha, NE 68144. (402) 333-9013.

HALLDORSON 3 to 1 audio transformer, copper casing. hard rubber panel 10 x 11 x 1/4. Gordon Wilson, 11108 - 50 Avenue, Edmonton, Alberta, Canada, T6H 0H9.

DETECTOR and AUDIO PORTION of GREBE CR2. Also need cabinet for same. NEED FRONT PANEL FOR SCOTT Phantom DELUXE. Larry Steeno, 2728 42nd Street, Two Rivers, WI 54221. (414) 794-7320.

MARCONIPHONE VIII cabinet, also Marconiphone VI chassis, or complete radios cash, or generous trade. Gordon Wilson, 11108 - 50 Avenue, Edmonton, Alberta, Canada, T6H 0H9.

WANTED: EMPTY CABINET for a Philco model 20 cathedral radio. I already have the radio and speaker. Must be in good condition. Joe Beach, 6515 Sunset, Garden City, MI 48135.

WANTED— CABINET AND PARTS FOR A FEDERAL 61. Mike Kibler, 300 Speiter #39, Danville, IL 61832. (217) 267-3703.

WANTED: ONE TUNING DIAL and one coil tap knob for a Crosley model XJ. Jack Emery, Box #84, 5546 Union Street, Lexington, MI 48450.

WANTED — PHILCO

PHILCO MODEL 20B 1930 "Baby Grand" radios. Original finish, and no chassis changes a must. Must be completely original and in working condition. Will pay top price for a real nice one. All replies will be answered. Write: Ronald G. Burtzos, 915 Crane Drive, Apt. 703, DeKalb, IL 60115.

PHILCO MODEL 90B, working or not. Original speaker from Philco model 20— must be in good shape. Thomas Abell, 1022 S. Edison Ave., South Bend, IN 46619. Phone (219) 234-8405.

CHASSIS ONLY FOR PHILCO cathedral, model 37-61, Charles A. D'Alessio, 136 Changebridge Road, K4, Montville, NJ 07045. ((201) 263-4747.

WANTED — ZENITH

ZENITH TRANSISTOR Trans-Oceanic 11 or 12 band radio- parts or com-plete. Have Rider TV manuals 2 thru 23 for offer. Wade, 657 14th Ave., Prospect Park, PA 19076.

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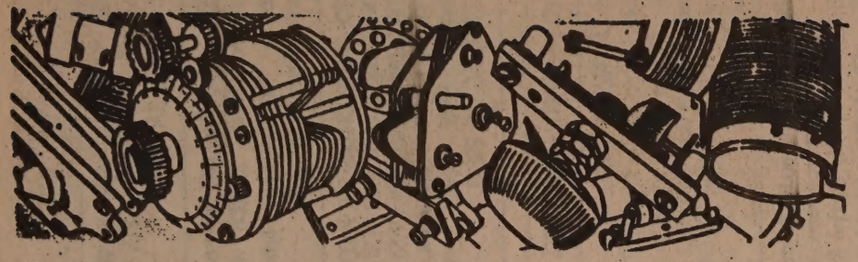

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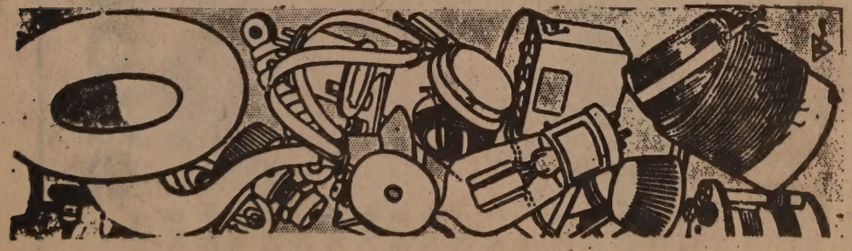

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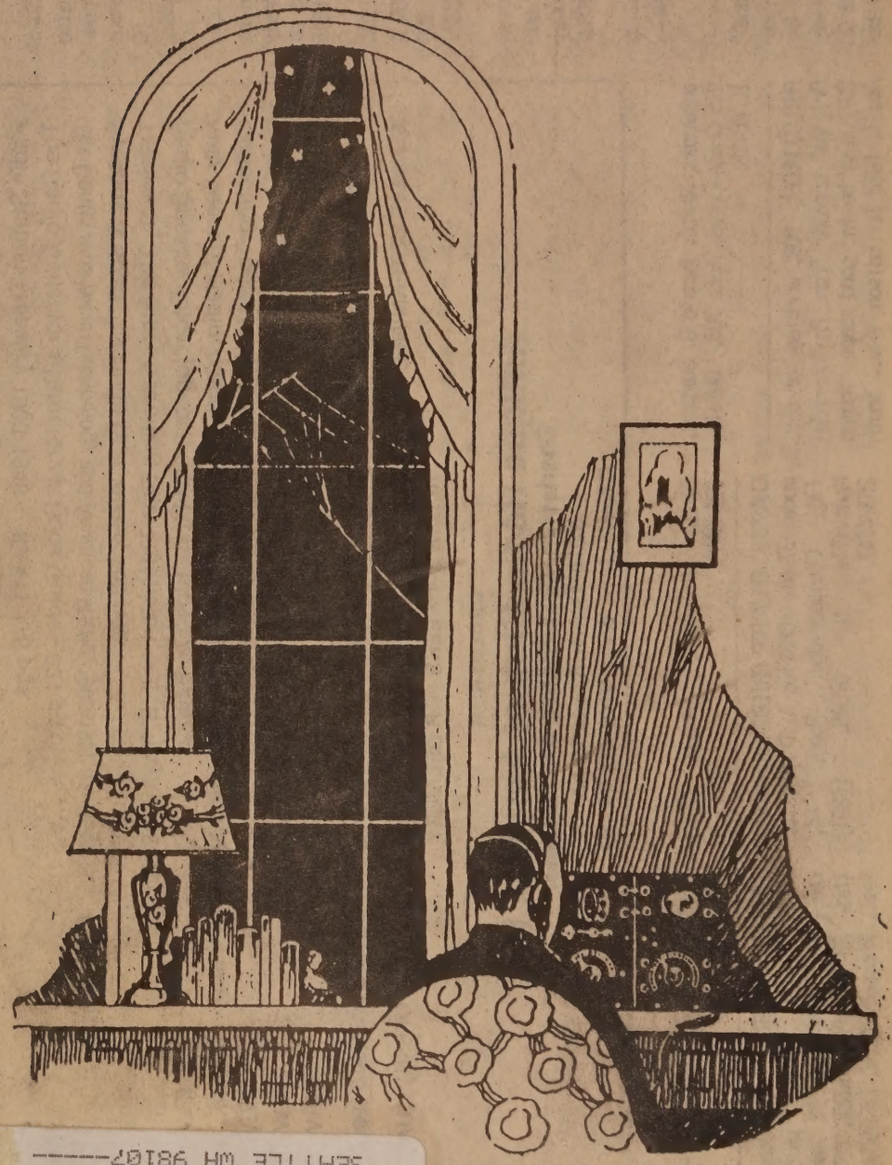

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